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Biohazardous Waste Management Plan

Todd Lane

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

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Biohazardous Waste Management Plan

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Abstract

This plan describes the process for managing non-medical biohazardous waste at Sandia National Laboratories/California. It applies to operations at the Chemical and Radiation Detection Laboratory (CRDL), Building 968, and other biosafety level 1 or 2 activities at the site. It addresses the accumulation, storage, treatment and disposal of biohazardous waste and sharps waste. It also describes the procedures to comply with regulatory requirements and SNL policies applicable to non-medical biohazardous waste.

BIOHAZARDOUS WASTE MANAGEMENT PLAN

Chemical and Radiation Detection Laboratory
Sandia National Laboratories/California

UNCLASSIFIED

October 2003

Author/Contact Person: Todd Lane

Signature	Org.	Phone	Date
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Approved by Owner: Malin Young

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	8130	4-2949	9/25/03

Approved by: Len Napolitano

Signature	Org.	Phone	Date
	8100	4-2615	10/8/03

Contents

1.0 GENERAL

1.1 Purpose

This plan describes the process for managing non-medical biohazardous waste at SNL/California. It also describes the procedures to comply with applicable Federal and State laws and regulations and SNL policies applicable to biohazardous waste.

1.2 Scope

This plan applies to all CRDL activities that produce biohazardous waste and sharps waste. It also extends to bioresearch laboratories that generate biohazardous waste outside Building 968. This plan does not apply to the SNL/California Medical Services.

1.3 Ownership

The manager of Department 8130 owns this plan.

2.0 RESPONSIBILITIES

The protocols established in this plan apply to all personnel who generate or handle biohazardous waste at SNL/California.

2.1 Generators

The generator of the biohazardous waste is responsible for the proper management of biohazardous waste he/she generates. These responsibilities include:

- completing the SNL/California Hazardous Waste Generators training and understanding the contents of this plan,
- characterizing and segregating biohazardous waste,
- properly storing, treating and disposing of the waste, and
- arranging for timely pickup of the waste, if required.

2.2 Managers

The Department Managers will assure that personnel have the required training and are competent in the practices for managing their waste streams. Manager with projects that generate biohazardous waste will make sure their staff are aware of the contents of this plan.

2.3 Department 8130

As owner of this plan, the Manager of Dept. 8130, shall assure it remains current and complete. The owner shall update this plan as necessary.

Department 8130 will take responsibility for the oversight, procedures and recordkeeping for the two autoclaves in Building 968 (located in rooms 125 and 114).

3.0 CONTACT PERSONS

3.1 Primary Contact Person

Todd Lane, Department 8130 (Phone: 294-2057)

3.2 Backup Contacts

Joe Schoeniger, Department 8130 (Phone: 294-2955)
David Brekke, Department 8517 (Phone: 294-2233)

3.3 Emergency or After-Hours Contact

In the event of any emergency or perceived emergency, call **911** (on a land line). This will put the person in contact with the SNL/California Central Alarm Station (CAS).

For any after-hours concerns, contact the CAS directly at **4-2300**.

4.0 TYPES OF BIOHAZARDOUS WASTE GENERATED

Sandia National Laboratories/California generates sharps waste; laboratory wastes; waste containing microbiologic specimens and other types of waste defined as biohazardous waste in Section 117600-118360 of the California Health and Safety Code. Sandia National Laboratories/California's CRDL does not generate medical waste and not subject to the California Medical Waste Management Act. If processes at the CRDL or other bioresearch activities at the site change and medical waste (as defined by the California Medical Waste Management Act) is produced, this plan will be updated as necessary.

5.0 DEFINITIONS

"Biohazard bag" means a disposable clear bag marked with the international biohazard symbol and the word "Biohazard", which is impervious to moisture and has a strength sufficient to preclude ripping, tearing, or bursting under normal conditions of usage and handling of the waste filled bag. A biohazard bag shall be constructed of material of sufficient single thickness strength to pass the 165-gram dropped dart impact resistant test as prescribed by Standard D 1709-85 of the American Society for Testing and Materials and certified by the bag manufacturer. Upon autoclaving the word "autoclaved" shall appear on the bag.

"Biohazardous waste" means laboratory waste, including, but not limited to, all of the following:

- Cultures and stocks of infectious agents from research and industrial laboratories.
- Wastes from the production of bacteria, viruses, or spores, used in research, and culture dishes and devices used to transfer, inoculate, and mix cultures.

- Waste containing any microbiologic specimens.

"Common storage facility" means any designated accumulation area that is onsite and is used by small quantity generators otherwise operating independently for the storage of Biohazardous waste for collection by a registered hazardous waste hauler.

"Container" means the rigid container in which the biohazardous waste is placed prior to transporting for purposes of storage or treatment.

"Highly communicable disease" means diseases, such as those caused by organisms classified by the federal Centers for Disease Control and Prevention as Biosafety Level IV organisms, which, in the opinion of the infection control staff, the department, local health officer, attending physician and surgeon, or attending veterinarian merit special precautions to protect staff, patients, and other persons from infection.

"Highly communicable diseases" does not include diseases such as the common cold, influenza, or other diseases not representing a significant danger to nonimmunocompromised persons.

"Infectious agent" means a type of microorganism, bacteria, mold, parasite, or virus, which normally causes, or significantly contributes to the cause of, increased morbidity or mortality of human beings.

"Combined waste" means mixtures of biohazardous and a hazardous (or radioactive) component. Combined waste is biohazardous waste, except for all of the following:

(a) Biohazardous waste and hazardous waste is hazardous waste and is subject to regulation as specified in the statutes and regulations applicable to hazardous waste.
(b) Biohazardous waste and radioactive waste is radioactive waste and is subject to regulation as specified in the statutes and regulations applicable to radioactive waste.
(c) Biohazardous waste, hazardous waste, and radioactive waste is radioactive mixed waste and is subject to regulation as specified in the statutes and regulations applicable to hazardous waste and radioactive waste.

"Offsite" means any location, which is outside the SNL/California boundaries.

"Onsite" means a biohazardous waste treatment facility on the SNL/California site.

"Sharps container" means a rigid, puncture-resistant container which, when sealed, is leak resistant and cannot be reopened without great difficulty.

"Sharps waste" means any device having acute rigid corners, edges, or protuberances capable of cutting or piercing, including, but not limited to, all of the following:

(a) Hypodermic needles, hypodermic needles with syringes, blades, needles with attached tubing, Pasteur pipettes, etc.
(b) Broken glass items.

"Storage" means the holding of biohazardous wastes at a designated accumulation area.

"Treatment" means any method, technique, or process designed to change the biological character or composition of any biohazardous waste so as to eliminate its potential for causing disease.

6.0 BIOHAZARDOUS WASTE SEPARATION AND ACCUMULATION

Principal Investigator/Supervisor is ultimately responsible for ensuring proper handling, storage, treatment, and disposal of all biohazardous waste generated in their facility.

Biohazardous wastes and hazardous wastes are separated by laboratory personnel (see Definitions, Section 5). There are four basic waste types addressed in this plan:

- Solid Biohazardous Waste
- Liquid Biohazardous Waste
- Combined Biohazardous Waste
- Sharps Waste

Each laboratory will have at least one biohazardous waste containers and a biohazard sharps container if these types of waste are generated. All containers will be appropriately labeled as to what materials can and cannot be discarded in each container.

6.1 Solid Biohazardous Waste

Solid biohazardous waste, except for sharps capable of puncturing or cutting, shall be contained during accumulation and prior to treatment and disposal in *clear* biohazard bags. During accumulation of waste, these biohazard bags will be placed in secondary containers that are rigid, leak-proof with tight-fitting lids. The secondary containers will be labeled with "Biohazardous Waste" or "Biohazard" and the International Biohazard Symbol. These marking will be clearly visible.

6.2 Liquid Biohazardous Waste

Liquid biohazardous waste will be contained separately at the point of generation using appropriate containers to collect the liquid waste. Liquid waste will be stored in a container with a lid and then autoclaved or chemically disinfected prior to disposal. The liquid waste containers will be labeled with "Biohazardous Waste" or "Biohazard" and the International Biohazard Symbol on the lid and/or sides to assure they are visible from any lateral direction.

6.3 Combined Biohazardous Waste

Every effort will be made to avoid generating waste that contains both a RCRA hazardous and biohazardous components. The Biosafety Officer and the Hazardous Waste Management Group shall be notified prior to the generation of this waste.

In the course of research and testing activities at the Chemical and Radiation Detection Laboratory (CRDL) or elsewhere on site, it is possible to generate waste containing both a RCRA regulated component and a biohazardous component. In such cases, the RCRA component of the waste takes precedence. Waste management considerations must be taken into consideration during the planning stages of the experiment. There must be an approved path for disposal of every waste type anticipated prior to commencing work.

The key to managing combined waste is to not generate it in the first place. If at all possible the experimental protocol should incorporate a final decontamination step to inactivate the biological component of the matrix. This may employ standard methods such as chemical disinfection or steam sterilization. These common lab practices prevent cross contamination of other work and thus become part of the experimental protocol--not waste treatment. This will eliminate the biological agent/toxin and, therefore, preventing the formation of combined waste. This practice does not require any approval.

If there is no practical way to avoid producing a solid or liquid waste that contains hazardous and/or radioactive components as well as biohazardous components, it must be segregated from other biohazardous waste. This waste must be collected in a separate container, labeled for both the biohazard and other hazardous component. The same requirements accumulation and storage apply as for biohazardous waste. An electronic hazardous waste tag (WDDR) will accompany this waste beginning at the time of initial generation.

6.4 Sharps Waste

Due to the inherent hazard, particular attention shall be paid to sharps. Waste sharps will be collected at the site of generation.

- Biohazardous sharps waste shall be contained in approved sharps containers labeled with the International Biohazard Symbol and the word "Biohazard." These shall be leak-proof puncture resistant containers that are labeled "Sharps Waste."
- Chemically contaminated sharps waste also must be collected in rigid sharps containers. These containers do not need to have the biohazard markings.

All sharps containers must possess an electronic waste tag (WDDR).

6.5 Storage

As a practice, biohazardous waste will not be stored for extended periods of time. Waste will be autoclaved in a timely fashion as soon as the containers become full or at least once every 7 days.

If it becomes necessary to store biohazardous waste the following guidelines will be adhered to.

Maximum Storage Times for Biohazardous Waste:
Biohazardous waste and filled biohazardous sharps containers shall not be stored for more than 7 calendar days at a temperature above 32 degrees Fahrenheit or zero degrees Celsius. This 7-day period begins when any waste has been placed in the container (or upon filling a sharps container). Biohazardous waste may be stored for a maximum of 90 days at or below 32 degrees Fahrenheit or 0 degrees Celsius. The 90-day period begins when any waste has been placed in the container. If the materials are stored at or below 32 degrees Fahrenheit or 0 degrees Celsius the freezers will have the temperature checked weekly to ensure that they are functioning properly.

Exception to storage rule: Small quantities of nominally contaminated solid waste may be stored up to seven days after the waste container is filled, if practical. To apply this exception, the waste may not contain active growth media.

Security and Placarding of Biohazardous and Biohazardous Waste Storage Facilities

The storage area used to store biohazardous waste for accumulation must be secured to prevent access by unauthorized persons. Warning signs must be posted on entry doors. Signs must be readily legible during daylight from a distance of at least 25 feet. Storage areas must be secure to deny access to unauthorized persons, animals, insects, wind and rain.

7.0 ONSITE TREATMENT AND DISPOSAL

Biohazardous waste generated by Sandia National Laboratories, California is treated on-site in one of the two autoclaves located in Building 968 (room 114 or 125) or treated by chemical disinfection. Once the containers are full or exceeded the allowable storage time, the biohazardous waste will be taken to an autoclave in Building 968 for treatment using procedures described in Appendix A, Autoclave Operating Procedure.

Only trained, approved personnel may operate the autoclave. Access to the autoclave rooms is controlled. The entrances to Building 968 are locked and under badge reader control at all times. The doors to rooms 114 and 125 are automatically locked after normal working hours.

7.1 Solid Biohazardous Waste

Solid biohazardous waste will be autoclaved and disposed of in the municipal trash. The waste will remain in the clear bag when autoclaved and discarded.

The procedure for autoclaving waste is provided in Appendix A.

Select Agents: Waste containing biotoxins on the select agent list will be disposed of as chemically hazardous waste, per SOP (SP473267).

7.2 Liquid Biohazardous Waste

Treated biohazardous waste in liquid or semi-liquid state can be discharged to the sanitary sewer if it is not a mixed waste containing radioactive, hazardous, or untreated biohazardous waste. A biohazardous waste of the following types (Subdivision (a) of Section 117635) may be treated by a chemical disinfection if the biohazardous waste is liquid or semi-liquid and the chemical disinfection method is recognized by National Institutes of Health, the Centers for Disease Control and Prevention, or the American Biological Safety Association. The biohazardous waste that may be treated by chemical disinfection includes, but not limited to, the following:

- Cultures and stocks of infectious agents from research and industrial laboratories.
- Wastes from the production of bacteria, viruses, spores, discarded live and attenuated vaccines used in human health care or research, and discarded animal vaccines.

Only hypochlorite bleach has been pre-approved for disposal down the drain for discharge into the public sewer system. All other chemical disinfectants or waste with any additional hazardous properties must be picked up by ES&H for disposal as hazardous waste, unless otherwise approved.

Other disinfectants may be approved on a case-by-case basis. It should be verified that the disinfectant is a certified, approved method. The default mode of disposal (for disinfectants other than bleach) is as chemical hazardous aqueous waste. Prior approval must be obtained prior to disposing these solution down the sink.

Steam sterilization may be an acceptable treatment method for certain types of liquid biohazardous waste.

Select Agents: Liquid biohazardous waste containing biotoxins on the select agent list will be disposed of as chemically hazardous waste, per SOP (SP473267).

7.3 Combined Biohazardous Waste

As stated in Section 6.3, every effort should be made to avoid generating combined biohazardous waste via the experimental protocol.

If there is not feasible way to prevent the production of a combined waste, the benchtop treatment rule (California AB 966; California Health and Safety Code Section 25200.3.1) may be employed. This rule allows small quantities of laboratory waste to be treat by established practices without permitting or other regulatory involvement. The following criteria must be met.

- Maximum of five gallons or 18 kilograms of waste (per batch)
- Laboratory hazardous waste (RCRA or non-RCRA)
- Treatment must be performed at a location that is as close as is practical to the location where the laboratory hazardous waste is generated

- Treatment is conducted within 10 calendar days after the date the laboratory hazardous waste is generated
- The laboratory hazardous waste treated shall be from a single procedure, or set of procedures that are part of the same laboratory process
- Treatment shall be by an established prudent practice
- The person performing the treatment must have knowledge of the waste, its hazards and the treatment method
- Treatment and training records for all persons performing treatment shall be maintained for a minimum of three years.

The investigator must demonstrate that the disinfection step of the experimental protocol or any benchtop treatment of waste is safe and effective. Specifically, the investigator must provide assurance that the addition of disinfectant does not result in an adverse chemical reaction, producing toxic gases or other hazardous conditions. **Approval must be obtained from the CRDL Facility Manager and Hazardous Waste Management Group prior to conducting benchtop treatment.**

Under no circumstances shall combined biohazardous waste be autoclaved without prior approval.

Once the biohazardous component of the waste is eliminated, the hazardous waste will be managed as RCRA waste.

7.4 Sharps Waste

7.4.1 Biohazardous Sharps Waste

Biohazardous sharps waste must be collected at the site of generation and accumulated and stored in leak-proof, puncture-resistant sharps containers. These containers must be approved for sharps waste and be labeled for biohazard and sharps. An electronic waste tag (WDDR) must accompany the container as soon as the first item is placed in it.

Sharps waste contaminated with biohazardous components accumulated at room temperature must be treated within 7 calendar days after the waste container becomes full. The preferred method of treatment is by steam sterilization (autoclaving). Once the container of sharps waste has been autoclaved, the biohazard labeling must be defaced (made unrecognizable) and the word "Autoclaved" must be placed on the container (either by initial application of autoclave tape or marking the container by hand afterward). The sharps (remaining in the sharps container) will then be disposed of as hazardous waste.

7.4.2 Non-Biohazardous Sharps Waste

Non-biohazardous (chemically hazardous) sharps waste must be collected in a leak-proof, puncture-resistant-approved sharps containers. However, no special color or biohazard labeling is necessary. An electronic waste tag must accompany the container as soon as the first item is placed in it. Once the container is full, it is disposed of as regular hazardous waste.

8.0 RECORD RETENTION

All tracking documents, treatment records, and other required documentation will be maintained for at least 3 years.

9.0 CLOSURE PLAN

Upon closure of the facility, all equipment, facilities, and non-disposable items used in the operation of the treatment process will be decontaminated either by steam sterilization or by disinfection with a commercial quaternary ammonium salt disinfectant, mixed and used per the manufacturer's directions.

10.0 EMERGENCY ACTIONS

General guidelines for cleaning up biohazardous spills are provided in Appendix B.

10.1 Personnel Exposures or Contamination

- Remove the exposed or contaminated personnel from the contaminated area, unless it is unsafe to do so due to the biohazardous condition of the victim or potential hazard to the rescuer.
- If the incident occurs during normal working hours, notify ES&H the SNL Medical Center.
- Administer first aid as appropriate.
- Remove any contaminated clothing.
- Proceed to the nearest emergency eyewash/shower to flush contamination from the eyes and skin.
- Stand by to provide emergency information.

In the event of a spill, unplanned release, or potential release of biohazardous waste to the environment, the ES&H Hotline (4-3724) will be contacted immediately. If the event occurs after normal business hours, notification should be made to the CAS at 4-2300. The CAS will make the necessary notifications and initiate necessary actions to mitigate or remediate the situation.

10.2 Contamination of Equipment and Facilities

- DO NOT attempt any cleanup or decontamination procedures alone or without wearing Personal Protective Equipment (PPE), including respiratory protection if respiratory pathogens may be present. Unless the spill is minor and well defined do not clean up the material without ES&H approval.
- Avoid spreading contamination by limiting access to the contaminated equipment or area only to individuals who are properly protected and trained to respond to all types of hazards that exist (e.g., biological, radioactive, and chemical).

- Report details and request assistance by contacting ES&H (ES&H Hotline, 4-3724) if the incident is during normal working hours. If the incident occurs after hours contact the CAS immediately at 4-2300.
- If the spill involves a liquid, place absorbent material on the spill and decontaminate with an approved disinfectant for a minimum of a 30-minute contact time.
- If sharps are involved, pickup using a mechanical means, such as tongs, forceps, or dustpan and broom. Do not use your hands to pickup any sharp items, even if gloves are worn.
- Decontaminate the equipment and area under ES&H direction using appropriate methods.
- Stand by to provide emergency information and assistance to Emergency Response Personnel.

10.2 Release to the Environment (air, water, soil)

- Stop the release, if safe to do so.
- Follow procedures described above for contamination of equipment and facility.
- Make immediate notifications.

10.4 Equipment Failure

There are two autoclaves in building 968: rooms 114 and 125. If equipment fails biohazardous waste will be handled by one of the following methods:

a) Complete the sterilization at the other autoclave in the building.
b) Biohazardous waste can be stored at temperatures greater than 32 °F (0°C) for up to 7 days prior to treatment.
c) The biohazardous waste may also be stored frozen for up to 90 days. Attempts will be made to complete repair within this time.

10.5 Natural Disasters

In the event of a natural disaster all research generating biohazardous waste will be suspended until adequate biohazardous waste treatment becomes available.

SNL/California autoclaves use electrical power to generate steam. Building 968 has auxiliary generators to provide backup power to autoclaves. In the event of an electrical or other problems related to natural disasters, the lab users need to coordinate with the Hazardous Waste Management Group (contact through the ES&H Hotline, 4-3724) to address waste handling and disposal options.

In the event of a spill, the biohazardous material will be disinfected using 10% bleach solution or another approved disinfectant for a 30-minute contact time and cleaned. Response to significant spills or releases of biohazardous agents will be coordinated with ES&H (4-3724).

Personnel performing disinfection procedures shall be equipped with the appropriate personal protective equipment (PPE) for the situation, but at a minimum shall wear chemical eye protection and latex gloves. Protective clothing, shoes, and a face shield may be required for large quantities of biohazardous materials. The Industrial Hygiene Group should be consulted for guidance on proper PPE.

10.6 Decontamination of Reusable Secondary Containers

Reusable secondary containers (garbage cans, bins, etc.) should be decontaminated each time they are emptied unless they are protected from contamination by disposable liners, bags, or other devices removed with the waste. These containers should be maintained in a clean and sanitary manner.
Approved methods of decontamination include, but are not limited to, agitation to remove visible soil combined with one of the following procedures:

- Exposure to hot water of at least 82 °C (180 °F) for a minimum of 15 seconds.
- Exposure to chemical sanitizer by rinsing with, or immersion in, one of the following for a minimum of 3 minutes:

  o Hypochlorite solution (500 ppm available chlorine)
  o Phenolic solution (500 ppm of active agent)
  o Iodoform solution (100 ppm available iodine)
  o Quaternary ammonium solution (400 ppm active).

11.0 TRAINING PLAN

Personnel handling biohazardous waste must be properly trained. Personnel are required to annually complete Hazardous Waste Generator Training (ENV 233) and Biosafety Training for SNL/CA (BIO 105 – CA). Specific training pertaining to biohazardous waste handling operations will cover:

- Definitions
- Regulatory requirements
- Biosafety levels
- Exposure control plan
- Methods of compliance

  o Universal precautions
  o Engineering controls & work practices
  o Laboratory practices
  o Personal protective equipment

- Post exposure evaluation
- Sharps injury log
- Emergency response
- Biohazardous waste management
- Decontamination of media.

Biohazardous Waste Training:

- Definition of biohazardous waste
- SNL Biohazardous Waste Management Plan review
- Safe work practices
- Selection and use of personal protective equipment (PPE)
- Signs and labels
- Collection, treatment and disposal of biohazardous waste
- Sterilization and disinfection techniques.

Safe Work Practices

- Use appropriate personal protective equipment (PPE)
- Follow Standard Operating Procedures
- Use good personal hygiene.

APPENDIX A

AUTOCLAVE OPERATING PROCEDURE

Biohazardous waste from laboratories can be treated by steam sterilization—autoclaving.

Procedure for autoclaving biohazardous waste:

1. When a biohazard bag or sharps container in the laboratory is ready to be processed, place the container in a cart or appropriate container and transport it to room 114 or 125 for sterilization.

Heat-sensitive autoclave indicator tape shall be used on each biohazard bag or sharps container that is processed onsite to indicate the attainment of adequate sterilization conditions. All records pertaining to onsite treatment of biohazardous waste must be maintained for not less than three years.

If the heat-sensitive autoclave indicator tape does not change color, the thermometer indicates that proper sterilization has not taken place, or the autoclave fails to complete the cycle, the waste will be transported in secondary containment to an alternative biohazardous waste treatment autoclave onsite or the waste will be transported offsite for treatment by an approved biohazardous waste hauler. The autoclave must then have maintenance, be posted as out of service, and be spore tested to indicate attainment of proper sterilization prior to being used for sterilization of biohazardous waste again.

2. Note the date on the autoclave chart recorder. Record the sterilization time showing the beginning of a cycle and the amount of time the autoclave was at sterilization temperature using the autoclave recorder.

3. Autoclave at least 30 minutes after the autoclave has reached a minimum of 121 °C (15 psi).

4. After sterilization is complete, the operator shall initial the recorder chart, verifying the time, temperature, and that the indicator tape showed sterilization took place. The operator shall also note any discrepancies in the chart and document an explanation for them. The operator shall also note on the chart the types of materials sterilized, using the following codes:

    1= Sterilizaton of new media or other material

    2 = Reusable glassware

    3 = Biohazardous waste material

5. In the event that sterilization is not completed correctly (does not reach temperature, does not hold for sufficient time, or indicator tape does not change), the following actions will be taken:

   a) Sterilization procedures will be shifted to the other autoclave in the building.

   b) Repair of the primary autoclave will immediately be effected by the Sandia National Laboratories.

6. Reusable glassware will be sterilized and then washed in a commercial glassware washer, dried and used again. Discarded plastics will be placed in garbage cans and treated as regular solid waste to be removed by the custodian.

7. Autoclaved biohazard sharps (remaining in the original sharps containers) will be disposed of as hazardous waste.

AUTOCLAVE TESTING PROCEDURE

Autoclaves used for sterilizing Biohazardous waste must be tested for adequate sterilization parameters once a month. The biological indicator *Bacillus stearothermophilus* will be used for this purpose. Follow the procedure below.

1. Place the unopened *Bacillus stearothermophilus* biological indicator ampule in the center of a typical load of Biohazardous waste. The biological indicator must be commercially obtained and specifically designed for determining the effectiveness of sterilization procedures.

2. Autoclave the waste according to the autoclave procedure for treatment of Biohazardous waste.

3. Follow the manufacturers directions for incubating and scoring results of the indicator ampules.

4. Record the result in the autoclave log. Log records must be maintained for a minimum of three years.

5. If the autoclaved ampule shows signs of bacterial growth, use of the autoclave must be discontinued until this procedure has been repeated. If a positive result is still obtained for the autoclaved ampule, the autoclave may not be used for sterilization of Biohazardous waste until serviced and proven by this test to be operating adequately.

6. Check the calibration of the autoclave thermometer annually and record the results in the autoclave log.

CALIBRATION OF AUTOCLAVES

On a yearly basis the autoclaves used for decontamination of biohazardous materials must be checked for correct autoclave temperatures. This is done using a indicating autoclave thermometer which indicates the maximum temperature to which material has been subjected during sterilization.
The final temperature will be noted in a log kept next to the autoclave. This procedure will be done on an annual basis at the beginning of each calendar year.

Following are general procedures; specific procedures must be maintained at each autoclave. Each autoclave must be operated as required by the operating conditions for that specific unit. These instructions must be posted by each unit.

1. Place autoclave tape or other indicator material on each autoclave bag prior to treatment. Following treatment the autoclave tape must be checked to verify the appropriate color change.

2. Place clear autoclave bags in a leak proof, heat-resistant container and load into the autoclave. Autoclaves must not be loaded beyond approved limits.

3. Place container of items to be autoclaved inside the autoclave. Close the autoclave door and ensure that it is secure it closed firmly.

4. Autoclave on the appropriate cycle, (liquid or dry) depending on the items being autoclaved. Run the dry cycle for items with a moisture content of 10% or less such as paper, plastics, labware, etc. Run the liquid cycle for items which may boil and need a slow exhaust to prevent overflow.

5. Autoclave the Biohazardous waste at a minimum of 121 °C (250 °F), 15 psi for a minimum of 30 minutes. Increase autoclave time by a minimum of 15 minutes for more dense loads or loads with a high liquid content.

6. Wait until the pressure has fallen to zero before opening the autoclave. When opening the autoclave door, take precautions to avoid exposure to steam and hot surfaces or liquids. Stand behind the autoclave door as you open it.

7. Allow liquids to cool several minutes before removing them from the autoclave. Use heat resistant gloves to remove items from the autoclave.

8. If the autoclave does not attain the minimum time and/or temperature, or the autoclave tape does not change color, a notation must be made in the comment section of the autoclave log. The load must then be re-autoclaved after placing new tape on the waste bags. If minimum time and temperature is not attained on the second cycle, users must contact the person responsible for maintenance of the unit to initiate repairs and notify ES&H. Waste should then be treated at an approved alternate autoclave.

9. Dispose of autoclaved bags with the regular trash as solid waste.

10. Complete the autoclave log for each autoclave cycle. The length of time that the unit maintains a temperature at or above 121 degrees Centigrade (250 degrees Fahrenheit) must be noted as the *time at 121°C* in the log. *All* other parameters must be noted as listed.

11. Department 8130 will test monthly with *Bacillus stearothermophilus* and record the results in the autoclave log.

12. Check the calibration of the autoclave thermometer annually and record the results in the autoclave log. This should be completed by an authorized autoclave service company during routine servicing.

13 All records including logs, calibration results, and *Bacillus stearothermophilus* tests must be kept for a minimum of three years. Logs and records must be available upon request during inspections.

APPENDIX B

GENERAL PROCEDURES FOR SPILL CLEANUP

DO NOT attempt any cleanup or decontamination procedures alone or without wearing Personal Protective Equipment (PPE), including respiratory protection if respiratory pathogens may be present. Unless the spill is minor and well defined do not clean up the material without ES&H approval. Notify ES&H (4-3724) immediately of any spills that have the potential for serious health or safety implications.

1. Determine the nature and the extent of the spill—what has been spilled (i.e., the chemical or biological agent), its concentration, quantity, and location.

2. Evacuate the area immediately (if necessary to prevent exposure of additional persons to a particularly toxic or virulent agent).

3. Provide immediate biohazardous treatment to those exposed (if warranted by the nature of the exposure).

4. Secure and post the spill area to prevent additional exposures and spread of the spill.

5. Put on appropriate personal protective equipment (PPE).
   a. Always: glasses, gloves, lab coat or apron, shoe coverings.

   b. As appropriate (depending on the nature of the spill): face shield or goggles, respirator, boots.

6. Contain the spill (e.g., by diking or ringing with absorbent material).

7. Decontaminate the spilled material if warranted (i.e., it is often prudent to decontaminate the spilled material before it is picked up). Disinfect using 10% bleach solution or another approved disinfectant for a thirty-minute contact time and cleaned.

8. Pick up the spilled material:
   a. Solids:
      1. Pick up by mechanical means (e.g., pan and brush, forceps).
      2. Discard as biohazardous, hazardous, or radioactive waste as appropriate.
   b. Liquids:
      1. Absorb the spill with absorbent material as appropriate (e.g., paper towels, vermiculite).
      2. Discard as biohazardous, hazardous, or radioactive waste as appropriate.
   c. Broken glass and other sharps:
      1. Pick up by mechanical means (e.g., forceps, pan and brush), never by hand.
      2. Dispose as sharps.

9. Decontaminate the area.

10. Rinse/clean the area (if necessary) and absorb and collect waste materials.

11. Dispose of collected material and cleanup materials as biohazardous, hazardous, or radioactive waste as appropriate.

12. Decontaminate reusable items (such as dust pans, brushes, forceps).

13. Remove personal protective equipment (PPE).
    a. Discard disposable items as biohazardous, hazardous, or radioactive waste as appropriate.
    b. Decontaminate reusable items (such as heavy rubber gloves, boots, aprons, gowns) before cleaning or laundering.

14. Wash all exposed skin thoroughly.

15. Perform biohazardous treatment and follow up as appropriate for the particular type of material.

Spill Outside of Building 968

If biohazardous material is spilled outside Building 968, immediately notify the CAS (4-2300), ES&H (4-3724) and the Biosafety Officer. If the Biosafety Officer is not available, notify the contacts in Section 3 of this plan.

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